

**REMARKS**

This is a response to the Office Action dated September 24, 2002, which is paper #14 of the above-referenced application. Applicants amend claims 1, 6, 8, 11, 12, 14, 17, and 21 to better clarify aspects of the present invention. Applicants add new claims 30-32 to the application. Pursuant to this amendment, claims 1 through 32 are pending. Reconsideration and reexamination of the present application are respectfully requested.

The Examiner indicated that claims 12 and 14-15 are allowable if rewritten in independent form including all of the limitations of base claim and any intervening claims. Applicants amend claims 12 and 14 to independent form including all of the limitations of their respective base claims and any intervening claims. In addition, claim 15 depends on claim 14. Accordingly, Applicants respectfully submit that claims 12 and 14-15 are in condition for allowance.

The Examiner objected claim 8 over informalities. The Examiner rejected claims 20 and 21 under 35 U.S.C. § 112 for containing subject matters not properly described in the specification, and rejected claims 3 and 6 under 35 U.S.C. § 112 as indefinite.

The Examiner rejected claims 1, 7-8, 13, and 16 as anticipated by U.S. Patent No. 5,204,917 to Arndt *et al.* (hereinafter the "Arndt"), rejected claims 1-3, 5, 10, 20-24, and 27-29 as anticipated by U.S. Patent No. 5,987,146 to Pluvinae *et al.* (hereinafter the "Pluvinae"), rejected claims 21 and 25 as anticipated by U.S. Patent No. 3,080, 011 to Henderson (hereinafter the "Henderson"), and rejected claims 21 and 26 as anticipated by U.S. Patent No. 3,934,100 to Harada (hereinafter the "Harada"). Moreover, the Examiner rejected claims 1-3, 5, 10, and 21 as obvious over Harada, and rejected claims 4, 6, 9, 11, and 17-19 as obvious over Harada in view of Pluvinae.

All objection and rejections are respectfully traversed for reasons stated below.

**Objection of claim 8**

Claim 8 was objected to over informalities. Applicants amend claim 8 to overcome this objection. Support of the amended claim 8 can be found, for example, in FIGS. 6-9, and page 11, lines 22-28 of the specification.

Rejections under 35 U.S.C. § 112

The Examiner rejected claims 20 and 21 under 35 U.S.C. § 112 for containing subject matters not properly described in the specification. Specifically, the Examiner contended that the specification failed to teach or to show “the tube portion which engages the ear” as claimed in claim 21 and “the insertion tool” as claimed in claim 20. As explained above, FIG. 22 and page 16, line 19-page 17, line 2 of the specification clearly show and/or teach the insertion tool, as claimed in claim 20. Moreover, FIGS. 3, 4, and 5, page 5, lines 16-18 and page 8, lines 3-15 of the specification clearly show and/or teach the above-mentioned limitation of claim 21. Thus, Applicants respectfully request withdrawal of the rejection as applied to claims 20 and 21.

The Examiner rejected claims 3 and 6 under 35 U.S.C. § 112 as indefinite. Specifically, the Examiner contended that the term “approximately perpendicular” in claim 3 was not defined. Applicants submit that the presently described hearing aid has a lower bend (e.g., the lower bend 24 shown in FIG. 4) that is located substantially in a plane which is approximately perpendicular to the plane in which the ear hook portion 20 lies. See page 8, lines 12-15 of the application. This lower bend 24 is bended from the middle portion of the tube 12 in order to be inserted into the ear canal of a user. The exact angle of the lower bend 24 depends on the ear shape of the particular user. Nevertheless, the bend angle of the lower bend 24 will always be approximately perpendicular to the plane in which the ear hook portion 20 lies so as to be inserted into the user’s ear. Thus, no person of ordinary skill in the art would have any difficulties to apprise the scope of the invention. As a result, Applicants respectfully request withdrawal of the rejection as applied to claim 3.

The Examiner further contended that it was unclear whether Applicants intended to use mass or weight for measuring the battery in claim 6. Applicants amend claim 6 to overcome the Examiner’s rejection.

Claim rejections – 35 U.S.C. § 102(b)

The Examiner rejected claims 1, 7-8, 13, and 16 as anticipated by Arndt. Applicants respectfully disagree.

Arndt describes a modular hearing aid having separate microphone, receiver, amplifier and battery modules. These modules can be individually packaged and yet are ruggedly connected together in a matter that allows for ease of assembly and speedy repair. As shown in FIG. 1 of Arndt, its earpiece 12 has a single-curved tube body extending outwardly from the

main body of the hearing aid 10. It is, however, unclear at all whether the free end of the earpiece 12 is to be inserted into the ear canal of the user. Even if the free end of its earpiece 12 is to be inserted into the user's ear canal, Arndt does not describe how the free end of the earpiece 12 is situated in the ear canal. Thus, Arndt's hearing aid 10 will likely suffer some drawbacks, such as the occlusion effect, as described in the background section the present application. See page 2, line 3-page 3, line 10 of the application.

Although Arndt's hearing aid has a tube-shaped earpiece 12, Arndt does not teach or suggest "a tube . . . having a preformed shape including a first bend extending from the case over the top of the ear of the user and a second bend extending from an outside of the ear into an ear canal of the user", as required by the amended claim 1 of the present application. Nor does Arndt teach or suggest "an eartip connected to the second end of the tube and configured to fit within the ear canal while allowing sounds outside and within the ear to pass through the ear canal around the eartip", as required by the amended claim 1 of the present application. Arndt also never teaches or suggests "wherein said tube is sufficiently rigid such that a 1 inch segment of said tube is not deflected 0.1 inch by a force of 1 g or less", as required by the amended claim 1. Furthermore, Arndt does not teach or suggest "a side surface for abutting a side surface of the hearing aid tube; and a key extending along the side surface in a direction substantially parallel to the longitudinal axis of the nipple," as required by claim 13 of the present application. As a result, the amended claim 1 and claims 7-8, 13 and 16 are distinguishable over Arndt and are in condition for allowance.

#### Claim rejections – 35 U.S.C. § 102(e)

The Examiner rejected claims 1-3, 5, 10, 20-24, and 27-29 as anticipated by Pluvinae. Applicants amend claims 1 and 21 to better clarify aspects of the present invention. As explained below, Applicants submit that the amended claim 1 and claims 2-3, 5, 10, 20-24, and 27-29 are distinguishable over Pluvinae and are in condition for allowance.

Pluvinae describes an open ear canal hearing aid system comprising a plurality of ear canal tubes sized for positioning in an ear canal of a user so that the ear canal is at least partially open for directly receiving ambient sounds. Pluvinae's hearing aid system essentially is a two-tube hearing aid system. Specifically, it has a first tube 30 for providing sounds to the ear canal of the user and a second tube 32 for collecting ambient sounds to be amplified by the microphone 42. As a result, the sounds received at the microphone have better quality due to the

filtering and reception of sounds by the human ear. See col. 3, line 57-col. 4, line 12 of Pluvinage.

Pluvinage, however, does not teach or suggest at least one important limitation of the amended claim 1 of the present application. Namely, Pluvinage does not teach or suggest “wherein said tube is sufficiently rigid such that a 1 inch segment of said tube is not deflected 0.1 inch by a force of 1 g or less”, as required by the amended claim 1. Therefore, the amended claim 1 and its dependent claims, claims 2-3 and 5, are distinguishable over Pluvinage and are in condition for allowance.

Claim 10 depends on claim 9. Pluvinage does not teach or suggest “the tube comprising a preformed tube having an outer diameter of about 1.6 mm or less and formed of a material with a durometer of about 65 to 85 Shore D”, as required by claim 10 of the present application. Thus, claim 10 is distinguishable over Pluvinage and is in condition for allowance.

Pluvinage does not teach or suggest “an inserting tool for inserting the second end of the hearing aid tube into the ear canal eartip, the inserting tool including an elongated holder with an elongated recess configured to received a portion of the hearing aid tube adjacent to the second end”, as required by claim 20 of the present application. Thus, claim 20 is distinguishable over Pluvinage and is in condition for allowance.

Pluvinage does not teach or suggest “wherein said tube is sufficiently rigid such that a 1 inch segment of said tube is not deflected 0.1 inch by a force of 1 g or less”, as required by the amended claim 21 of the present application. Thus, the amended claim 21 and its dependent claims, claims 22-24 and claims 27-29, are distinguishable over Pluvinage and are in condition for allowance.

#### Claim rejections – 35 U.S.C. § 102(b)

The Examiner rejected claims 21 and 25 as anticipated by Henderson. Applicants amend claim 21 to better clarify aspects of the present invention. As amended, Applicants submit that claims 21 and 25 are distinguishable over Henderson and are in condition for allowance.

The amended claim 21 recites, in pertinent part, “wherein said tube is sufficiently rigid such that a 1 inch segment of said tube is not deflected 0.1 inch by a force of 1 g or less.” Henderson does not teach or suggest the above-mentioned limitation of the amended claim 21. Thus, the amended claim 21 and its dependent claim, claim 25, are distinguishable over Henderson and are in condition for allowance.

Claim rejections – 35 U.S.C. § 102(b)

The Examiner rejected claims 21 and 26 as anticipated by Harada. Applicants amend claim 21 to better clarify aspects of the present invention. As amended, Applicants submit that claims 21 and 26 are distinguishable over Harada and are in condition for allowance.

The amended claim 21 recites, in pertinent part, “wherein said tube is sufficiently rigid such that a 1 inch segment of said tube is not deflected 0.1 inch by a force of 1 g or less.” Harada does not teach or suggest the above-mentioned limitation of the amended claim 21. Thus, the amended claim 21 and its dependent claim, claim 26, are distinguishable over Harada and are in condition for allowance.

Claim rejections – 35 U.S.C. § 103

The Examiner rejected claims 1-3, 5, 10, and 21 as obvious over Harada. Applicants amend claims 1 and 21 to better clarify aspects of the present invention. As amended, Applicants submit that claims 1-3, 5, 10, and 21 are distinguishable over Harada and are in condition for allowance.

The amended claim 1 recites, in pertinent part, “wherein said tube is sufficiently rigid such that a 1 inch segment of said tube is not deflected 0.1 inch by a force of 1 g or less.” Harada does not teach or suggest the above-mentioned limitation of the amended claim 1. Thus, the amended claim 1 and its dependent claims, claims 2-3 and 5, are distinguishable over Harada and are in condition for allowance.

As a dependent claim of claim 9, claim 10 requires, in pertinent part, “the tube comprising a preformed tube having an outer diameter of about 1.6 mm or less and formed of a material with a durometer of about 65 to 85 Shore D.” Harada does not teach or suggest this limitation of claim 10. Thus, claim 10 is distinguishable over Harada and is in condition for allowance.

The amended claim 21 recites, in pertinent part, “wherein said tube is sufficiently rigid such that a 1 inch segment of said tube is not deflected 0.1 inch by a force of 1 g or less.” As discussed, Harada does not teach or suggest the above-mentioned limitation of the amended claim 21. Thus, claim 21 is distinguishable over Harada and is in condition for allowance.

Claim rejections – 35 U.S.C. § 103

The Examiner rejected claims 4, 6, 9, 11, and 17-19 as obvious over Harada in view of Pluvinaige. Applicants amend claims 1 and 17 to better clarify aspects of the present invention.

As amended, Applicants submit that claims 4, 6, 9, 11, and 17-19 are distinguishable over Harada and Pluinage and are in condition for allowance.

Claims 4 and 6 depend on claim 1. As discussed, neither Harada nor Pluinage teaches or suggests the above-mentioned limitation of the amended claim 1. Thus, claims 4 and 6, either viewed alone or in combination, are distinguishable over Harada and Pluinage, and are in condition for allowance.

Claim 9 recites, in pertinent part, “the tube comprising a preformed tube having an outer diameter of about 1.6 mm or less and formed of a material with a durometer of about 65 to 85 Shore D.” Neither Harada nor Pluinage teaches or suggests the above-mentioned limitation of claim 9. In the Office Action, the Examiner nevertheless took office notice that it is “well-known in the art to use plastic material with hardness between 65 to 85 Shore D when constructing hearing aids for durability and strength.” Applicants respectfully disagree. As described in FIGS. 30-31 and page 9, line 24-page 10, line 20 of the present application, Applicants specifically chose the above-mentioned relative rigidity of the tube 12 to allow the tube to apply a torque to the eartip 14 to maintain the eartip in a position in which the eartip is pressed against an anatomical feature within the ear canal. This preferred range is based on experiments conducted by the Applicants, an exemplified result of which is shown in FIG. 31 of the present application. Therefore, Applicants submit that the Examiner cannot without any support arbitrarily take official notice that the hardness between 65 to 85 Shore D is well-known in the art. If the Examiner believes that this hardness range is well-known in the art, Applicants respectfully request the Examiner to specifically point out how is it well-known in the art. As a result, Applicants submit that claim 9, either viewed alone or in combination, is distinguishable over Harada and Pluinage, and is in condition for allowance.

Claim 11 depends on claim 9. Thus, claim 11, either viewed alone or in combination, is similarly distinguishable over Harada and Pluinage, and is in condition for allowance.

The amended claim 17 recites, in pertinent part, “wherein each of said plurality of tubes is sufficiently rigid such that a 1 inch segment of each of said plurality of tubes is not deflected 0.1 inch by a force of 1 g or less.” As discussed, neither Harada nor Pluinage teaches or suggests the above-mentioned limitation of the amended claim 17. Thus, claim 17 and its dependent claims, claims 18 and 19, either viewed alone or in combination, are distinguishable over Harada and Pluinage, and are in condition for allowance.

The newly added claim 30 depends on claim 1. Applicants submit that claim 30 distinguishes over the art of record and is in condition for allowance.

The newly added claim 31 depends on claim 17. Applicants submit that claim 31 distinguishes over the art of record and is in condition for allowance.

The newly added claim 32 depends on claim 21. Applicants submit that claim 32 distinguishes over the art of record and is in condition for allowance.

**CONCLUSION**

Accordingly, in view of the above remarks, it is submitted that this application is now ready for allowance. Early notice to this effect is solicited.

If in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned at (415) 393-2404.

If an appropriate payment does not accompany or precede this submission, the Commissioner is hereby authorized to charge any fees required under 37 C.F.R. §§ 1.16 and 1.17, including any petition for extension of time, or to credit any overpayment, to Deposit Account No. 50-2518, billing reference no. 22645-7013.

DATE: 3/21/03

Respectfully submitted,

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**Version with markings to show changes made**

1. (Amended) A hearing aid system, comprising:

a hearing aid case configured to be worn behind the ear of a user, the case containing a microphone, a processor unit, and a speaker for delivering amplified sounds to an output connector of the case;

a tube having a first end for attaching to the output connector of the case and a second end, the tube having a preformed shape including a first bend extending from the case over the top of the ear of the user and a second bend extending from an outside of the ear into an ear canal of the user; and

an eartip connected to the second end of the tube and configured to fit within the ear canal while allowing sounds outside and within the ear to pass through the ear canal around the eartip, wherein said tube is sufficiently rigid such that a 1 inch segment of said tube is not deflected 0.1 inch by a force of 1 g or less.

2.12

6. (Amended) The hearing aid system according to Claim 1, wherein the hearing aid case including a battery has a mass weight of 1.5 grams or less.

8. (Amended) The hearing aid system according to Claim 7, wherein the first end of the tube includes a connecting member having a keyway configured to receive the key of the case and an opening for receiving the nipple of the case.

11. (Amended) The hearing aid tube tubing according to Claim 10, wherein the tube has been formed at high temperature to retain the first and second bends.

12. (Amended) A The hearing aid tube tubing according to Claim 10 for connecting a case of a behind the ear hearing aid to an ear canal eartip, the tube comprising a preformed tube having an outer diameter of about 1.6 mm or less and formed of a material with a durometer of about 65 to 85 Shore D, wherein the tube has a first bend configured to extend over the top of the ear of the user and a second bend configured to extend from an outside of the ear into an ear canal of the user and the tube is sufficiently rigid that a 1 inch (2.54 cm) segment of the tube is not deflected 0.1 inch (2.54 mm) by a force of 1 gram or less.

14. (Amended) A The hearing aid case according to Claim 13, comprising:  
a case body configured to be worn behind the ear of a user, the case body containing a  
microphone, a processor unit, and a speaker;  
a battery compartment within the case; and  
a tube attachment end for connecting the case body to a hearing aid tube for delivering  
amplified sounds from the speaker to an ear canal of the user, the tube attachment end including:  
an end surface for abutting an end of the hearing aid tube;  
a nipple extending from the end surface and configured to be received in the end  
of the hearing aid tube, the nipple having a longitudinal axis;  
a side surface for abutting a side surface of the hearing aid tube; and  
a key extending along the side surface in a direction substantially parallel to the  
longitudinal axis of the nipple, the key arranged to maintain a proper orientation between the  
case body and the hearing aid tube when the hearing aid tube is connected to the case body,  
 wherein the nipple includes a circumferential ring for retaining the hearing aid tube in a snap fit.

17. (Amended) A kit of parts for assembling hearing aids, comprising:  
 a plurality of tubes each having a preformed shape including a hook for extending from a hearing aid case over a top of an ear of a user, a run extending from the top of the ear to the ear canal, and an ear canal end extending into the ear canal of the user, wherein the plurality of tubes differ in a length of the run or a length of the ear canal end;

a plurality of eartips for connection to the ear canal end of the tubes and configured to fit within the ear canal while allowing sound to pass through the ear canal around the eartip; and

a plurality of behind the ear hearing aid cases including different sound processing components the cases having a connection end for connection to the tubes, wherein each of said plurality of tubes is sufficiently rigid such that a 1 inch segment of each of said plurality of tubes is not deflected 0.1 inch by a force of 1 g or less.

21. (Amended) A hearing aid device, comprising:

an eartip adapted to be inserted into a human ear canal and to engage an anatomical structure of the canal; and

a tube having a first end adapted to be connected to a source of sound and a second end adapted to be connected to the eartip, the tube shaped to have a hook-shaped portion which can be engaged with ~~engages~~ the ear over the top of the ear and a portion which extends into the ear canal, and the tube having sufficient ~~sufficiently~~ rigidity to position and hold the eartip in the ear canal when the hearing aid device tube is engaged with the ear, wherein said tube is sufficiently rigid such that a 1 inch segment of said tube is not deflected 0.1 inch by a force of 1 g or less.